ABSTRACT

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Title of diploma thesis: Assessment of activity and expression of selected isoforms of glutathione S-transferase in the *in vivo* model of glutamate-induced obesity

Obesity is a chronic disease with an increasing prevalence worldwide. This disease is associated with many pathophysiological changes in the organism; a possible influence on the antioxidant defenses of the organism is one of them. The aim of this study was to determine specific activity, protein expression and mRNA level of selected isoforms of glutathione S-transferase (GST) in the cytosol obtained from kidney and heart of the male NMRI mice with the obesity induced by repeated subcutaneous administration of monosodium glutamate (MSG) and in healthy controls. The specific activities were assayed by spectrophotometric method using universal and specific substrates. Protein expression of GST isoforms from GSTA, GSTM and GSTP families was monitored using denaturing polyacrylamide gel electrophoresis and immunoblotting. The mRNA level of selected GST genes was determined by real-time PCR. In the cytosolic fraction of MSG mice kidney, increase in total GST specific activity (universal substrate) by 31%, which was accompanied with increase in protein expression of GSTA isoform (6x) and GSTA1/2 mRNA expression (6.4x) in comparison to control, was observed. In contrast, total GST specific activity was reduced by 51% in the heart of MSG mice, which was accompanied with decrease in GSTP protein expression by approximately 50% and GSTP1/2 gene expression by 56% compared to the control groups of mice. Also the expression of GSTZ1 mRNA increased twofold in the heart tissue of MSG mice. Specific activity against the other two substrates, protein and gene expression of other GST isoforms hasn´t been significantly changed due to the obesity induction in none of the tissues.